

What is claimed is:

- 1 1. A signal processor for providing input signals to a direct conversion modulator
2 comprising means for producing the square root of input signals and providing square
3 root signals to the direct conversion modulator.
- 1 2. The signal processor of claim 1 wherein said square root circuit is comprised in a
2 digital signal processor.
- 1 3. The signal processor of claim 1 wherein said square root circuit comprises an
2 analog circuit.
- 1 4. A direct conversion transmitter comprising signal means providing an input signal
2 at a baseband frequency;
3 a square root circuit for providing a modulation input signal for a modulator at a
4 square root of baseband frequency;
5 a modulator modulating the output of the square root circuit, said modulator
6 comprising a local oscillator providing a frequency of one half RF, where RF is the
7 transmission frequency;
8 a variable gain amplifier for a gain applied to the output of said modulator;
9 a squaring circuit for squaring the modulated signal; and
10 gain control means for providing dynamic range in the radio frequency, said gain
11 control means providing a output for a coupling to a transmission antenna.
- 1 5. The transmitter according to claim 4 wherein said signal means provides an in-
2 phase signal and quadrature signal for modulation and wherein said modulator comprises
3 a Gilbert cell modulator.
- 1 6. The transmitter of claim 5 wherein said circuit is comprised in a digital signal
2 processor receiving the input signals.
- 1 7. The transmitter of claim 5 wherein said square root circuit comprises an analog
2 circuit.

1 8. The transmitter of claim 6 wherein said squaring circuit comprises a Gilbert
2 multiplier.

1 9. In a direct conversion transmitter having the pre-distortion means process a
2 baseband signal to be modulated at a frequency lower than a baseband frequency, the
3 improvement wherein said pre-distortion means comprises a square root circuit.

1 10. The improvement according to claim 9 where in said a transmitter further
2 comprises a modulator utilizing a local oscillator frequency which is one half of the
3 transmission frequency.

1 11. The transmitter according to claim 10 wherein variable gain is applied in the
2 domain of the pre-distorted signal.

1 12. The improvement of claim 11 further comprising a squaring circuit for squaring
2 the modulated, gain controlled initial frequency.

1 13. The transmitter according to claim 12 for the comprising variable gain means for
2 controlling gain in the radio frequency domain.